Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of the Commission's Rules	)	WT Docket No. 19-140
To Promote Aviation Safety	)	

REPLY COMMENTS OF GLOBALSTAR, INC.

Globalstar, Inc. ("Globalstar") hereby replies to comments on the Federal Communications Commission's ("Commission's") above-captioned Notice of Proposed Rulemaking proposing various amendments to its rules to promote aviation safety, including service rules for the Aeronautical Mobile Airport Communications System ("AeroMACS").[1] As Globalstar explained in its comments on the WiMAX Forum's 2017 AeroMACS Petition for Rulemaking,[2] the Commission's AeroMACS service rules must ensure that airport surface communications do not cause harmful aggregate interference to Globalstar's mobile satellite service ("MSS") operations and customers.

I. Globalstar's MSS Network and Its Operations at 5 GHz

Globalstar, a leading provider of global mobile satellite voice and data services, has invested over $5 billion to develop its global non-geostationary ("NGSO") MSS network. It uses its constellation of satellites and 24 ground stations on six continents to provide affordable, high-quality MSS to over 700,000 customers in over 120 countries around the world. Globalstar is licensed for uplink transmissions (mobile earth stations to satellites) in the Big

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1 *Amendment of the Commission's Rules Promote Aviation Safety*, Notice of Proposed Rulemaking, 34 FCC Rcd 4984 (2019).

2 WiMAX Forum Petition for Rulemaking to Adopt AeroMACS Service Rules, RM-11793 (Mar. 31, 2017); Reply Comments of Globalstar, Inc., RM-11793 (Sep. 5, 2017).

LEO band at 1610-1618.725 MHz, and for downlink transmissions (satellites to mobile earth stations) at 2483.5-2500 MHz.[3]

Globalstar also holds licenses for uplink transmissions between its gateway earth stations and space stations ("feeder links") in the 5096-5250 MHz band.[4] This licensed feeder link spectrum overlaps with the Unlicensed National Information (U-NII) spectrum in the 5150-5250 MHz band (the "U-NII-1 band"), as well as with the Commission's allocation for AeroMACS operations at 5091-5150 MHz. Every Globalstar satellite "hears" all U-NII-1 transmissions and any other terrestrial transmissions at 5096-5250 MHz across a constantly moving 7,800-kilometer-wide area on the Earth's surface. In 2014, the Commission permitted outdoor, higher-power access points to operate in the U-NII-1 band for the first time,[5] and since then numerous entities have likely deployed hundreds of thousands, if not millions, of these access points around the country. Globalstar's measurements have confirmed that the noise level in the U-NII-1 band over the United States is now 1 to 2 dB higher than it was in May 2014, and this rising noise floor threatens to cause serious degradation to Globalstar's MSS offerings, including dropped calls, geographic coverage holes, failed call attempts, and impaired

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3 *Application of Loral/Qualcomm Partnership, L.P. for Authority to Construct, Launch, and Operate Globalstar, a Low Earth Orbit Satellite System, to Provide Mobile Satellite Services in the 1610-1626.5 MHz/2483.5-2500 MHz Bands*, Order and Authorization, 10 FCC Rcd 2333 (1995); *Globalstar Licensee LLC; Application for Modification of Non-geostationary Mobile Satellite Service Space Station License; GUSA Licensee LLC; Applications for Modification of Mobile Satellite Service Earth Station Licenses; GCL Licensee LLC, Applications for Modification of Mobile Satellite Service Earth Station Licenses*, Order, 26 FCC Rcd 3948, ¶¶ 2 n.1, 3 (IB 2011) ("*2011 Globalstar Licensing Order*"). Iridium is authorized to share spectrum with Globalstar at 1617.775-1618.725 MHz.

4 *2011 Globalstar Licensing Order* ¶ 3.

5 *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, First Report and Order, 29 FCC Rcd 4127 (2014).

data transmissions.[6] In response to this threat, Globalstar in May 2018 petitioned the Commission to issue a Notice of Inquiry regarding the viability of continued spectrum sharing between its licensed MSS feeder links and outdoor access points systems in this band.[7] It is in the context of this rising noise floor at 5 GHz that Globalstar replies to comments on the Commission's proposed service rule for AeroMACS systems, another potential source of harmful aggregate interference to Globalstar's licensed services at 5 GHz.

II. The Commission's AeroMACS Framework Must Protect Globalstar's MSS Network and Its Customers

In establishing a regulatory framework for AeroMACS systems at 5091-5150 MHz, the Commission should ensure that such operations do not materially contribute to the 5 GHz noise rise already occurring over North America. Significantly, the International Telecommunications Union ("ITU") took into consideration the issue of aggregate interference to Globalstar MSS feeder links when it allocated the 5091-5150 MHz band to the aeronautical mobile (route) service (AM(R)S) at WRC-2007 (for applications such as AeroMACS and other aeronautical services). The ITU's allocation decision was based in part on an agreement on aggregate interference between Globalstar and various aeronautical interests, memorialized in ITU Recommendation ITU-R M.1827-1.[8] Under

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6 *See* Petition for Notice of Inquiry of Globalstar, Inc., RM-11808, at 10-12, 17 (May 21, 2018) ("Petition"); *Globalstar 5 GHz Noise Floor Measurement Description and Current Results* (May 21, 2018), attached as Appendix A to Petition; Roberson and Associates, LLC, *Analysis and Impact of Noise Rise in Feeder Uplinks of Globalstar Mobile Satellite Network*, attached as Appendix B to Petition, at 45-46 (May 21, 2018).

7 *See* note 6 *supra*.

8 International Telecommunications Union, Recommendation ITU-R M.1827-1, *Guideline on Technical and Operational Requirements for Stations of the Aeronautical Mobile (R) Service Limited to Surface Application at Airports in the Frequency Band 5091-5150 MHz* (Jan. 2015). At WRC-07, the ITU resolved that "any AM(R)S systems operating in the frequency band 5091-5150 shall meet the [Standards and Recommended Practices (SARPs)] requirements published in Annex 10 of the ICAO Convention on International Civil Aviation

this agreement, aggregate emissions from all aeronautical operations at 5091-5150 MHz are limited to a noise level increase at Globalstar's satellite receivers of no more than 6%, with aeronautical navigational service ("ARNS") operations accounting for no more than 3%, aeronautical mobile telemetry ("AMT") accounting for no more than 1%, and AeroMACS operations accounting for no more than 2%. If no ARNS is present at 5091-5150 MHz, AeroMACS is permitted to increase the noise level at 5091-5150 MHz by up to 5%.

The Commission's AeroMACS service rules must ensure U.S. compliance with the ITU's provisions and minimize any AeroMACS-related aggregate interference to Globalstar's MSS operations. While Globalstar will continue to monitor the 5 GHz noise floor and assess the effects of future AeroMACS deployments, it appears that the regulatory framework laid out by the Commission – including individual station-by-station licensing and license eligibility limited to airport owners and operators and other entities approved by airports – is well designed to achieve these goals.

In its comments, however, the WiMAX Forum urges the Commission to depart from its proposed framework by moving to a "license by rule" approach that involves more flexible user eligibility rules, a single AeroMACS "channel manager" for AeroMACS, and system coordination through third-party AeroMACS user databases at each airport.[9] Globalstar understands the potential administrative-efficiency benefits of the Forum's proposals, and it takes no position on the relative benefits of this alternative framework for AeroMACS

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and the requirements of Recommendation ITU-R M.1827, to ensure compatibility with FSS systems operating in that band." International Telecommunications Union, *Final Acts of WRC-07*, at 476-77, Resolution 748, *Compatibility Between the Aeronautical Mobile (R) Service and the Fixed-Satellite Service (Earth-to-Space) in the Band 5091-5150 MHz* (Geneva, 2007).

[9] Comments of the WiMAX Forum, WT Docket No. 19-140, at 10-17 (Sep. 3, 2019) ("WiMAX Forum Comments").

development. If the Commission shifts to the Forum's approach, though, it must take additional steps to ensure that AeroMACS operations do not materially contribute to a further noise level rise at 5 GHz.[10]

First, as Boeing urges in its comments, the Commission's service rules should reflect the primary purpose of AeroMACS, which is to enhance aviation safety by enabling high-capacity safety and regularity of flight communications at airports. As Boeing states, "AeroMACS was not developed, and should not be construed, as an all-purpose generic communications service to satisfy the general communications needs of airport operators."[11] Broader user eligibility and a resulting conversion of AeroMACS to a generic communications service could significantly increase wireless traffic at 5091-5150 MHz and heighten the risk of harmful aggregate interference to Globalstar's MSS operations. Accordingly, Globalstar supports Boeing's suggested modifications to the Commission's proposed AeroMACS rules (proposed Sections 87.5 and 87.601), changes that would appropriately limit the scope of this service.[12]

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[10] In its comments, the WiMAX Forum acknowledges the need to protect Globalstar's MSS operations and states that "the Commission could obligate the Channel Manager to manage AeroMACS spectrum assignments to comply with its rules, which thus would include Recommendation ITU-R M.1827-1." *Id.* at 20. It states further that the Commission should adopt a rule that requires the channel manager, among other things, to manage use of AeroMACS channels "in a manner that . . . complies with footnote US444B(a)(1) of the Table of Allocations" (which requires compliance with Recommendation ITU-R M.1827-1). *Id*. While Globalstar supports such a rule, it believes that the Commission should take additional action to ensure protection of its MSS offerings in the event of a shift to the Forum's proposed AeroMACS framework.

[11] Comments of the Boeing Company, WT Docket No. 19-140, at 9 (Sep. 3, 2019).

[12] *Id.* at 10. Boeing states that its proposed rule revisions would "help to prevent AeroMACS from transforming into an unfettered general purpose communication service that would congest the 5091-5150 MHz band while failing to serve the aviation safety objectives for which the service was designed." *Id.*

Second, if the Commission adopts the WiMAX Forum's proposed framework, it should make clear either by rule or order that, in the event of harmful interference to Globalstar or other licensees, an AeroMACS channel manager must make all relevant information on AeroMACS usage available to the Commission. The WiMAX Forum itself recognizes that the Commission should be able to "require the Channel Manager to make usage information available to Commission staff or other authorities in cases of interference to critical safety-related air traffic control AeroMACS applications,"[13] but this obligation to share information with the Commission should extend to AeroMACS-related harmful interference to Globalstar's MSS operations. Certainly, if it appears the AeroMACS transmissions are materially contributing to harmful aggregate interference to Globalstar's satellite offerings, the Commission should have access to the identity and location of all AeroMACS users at 5091-5150 MHz, so that it can initiate remedial action and help protect Globalstar's MSS network and customers from the deleterious effects of such interference.[14]

III. Conclusion

Globalstar urges the Commission to adopt service rules that ensure that AeroMACS does not materially contribute to harmful aggregate interference to Globalstar's MSS network and customers. If the Commission adopts the alternative framework proposed by the WiMAX Forum, the Commission should protect Globalstar's satellite offerings by (i) limiting

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[13] WiMAX Forum Comments at 15.

[14] In its comments, Aviation Spectrum Resources, Inc. states that "[s]election of a single channel manager-licensee will facilitate the resolution of interference questions that implementation of AeroMACS may pose for Globalstar." Comments of Aviation Spectrum Resources, Inc., WT Docket No. 19-140, at 12 (Sep. 3, 2019). Effective remedial action by the Commission will only be possible, however, if the channel manager is required to provide the Commission with information regarding the identity and location of AeroMACS users around the United States.

AeroMACS to operations that enhance aviation safety and (ii) requiring any AeroMACS channel manager to respond to complaints of harmful interference by sharing all relevant usage information with the Commission.

Respectfully submitted,

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